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The Journal of the Telephone Industry

SEPTEMBER 22, 1945

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ABC of the Telephone

By FRANK E. LEE

PART XIV. The 13th article in this series appeared in the July 14 issue, page 14.

ALL methods of connecting the calling telephone with the called telephone are grouped together under the name "switching." Viewed in the light of merely connecting one telephone with another, an appreciation of switching becomes a matter of discussing fundamentals. This is true of the manually operated switching systems, as well as of the numerous dial systems.

Except in rare cases, a telephone user has a need to be connected with

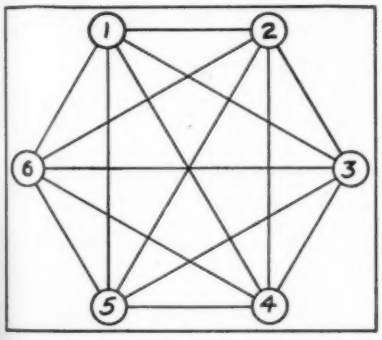


FIG. 1

more than one telephone at one time. It would be possible to interconnect six telephones, as illustrated in *Fig. 1*, by placing wires between each of the separate stations. This method would provide circuits to enable any one telephone to communicate with any one of the other five stations.

At any given time, there could be only three talking circuits in use. If these original six stations are thought of as pairs of telephones, it can be seen that only three talking circuits are provided. *Fig. 2* illustrates this point.

If three pairs of telephones are united at a central office switchboard, a system is formed which permits the establishment of 15 different communication circuits where only three were possible before. In this arrangement *(Fig. 3)*, the talking circuits are set up through the central office switching equipment. An exchange system with 10,500 telephones gives 55,119,750 lines of communication. In other words, if it were possible to interconnect 10,500 telephones without the use of a central office switchboard, it would require 55,119,750 talking circuits to provide communication from each individual telephone to every other telephone in the group. Obviously, a system of this sort would be impracticable because of its enormous size and cost.

A telephone switchboard might be likened to a mail forwarding room of a postoffice where letters that come in are routed to their proper destinations. At the telephone switchboard, incoming calls are routed to the proper called telephone. The type and amount of switching equipment to be used depends upon the number of telephones served by the exchange and the calling rates over these lines.

One of the simplest of switchboards is found in the cordless board for ground return local battery sets. It is true that there are not many of these boards in use today, however, the principles involved easily lead into the common battery cordless board for metallic

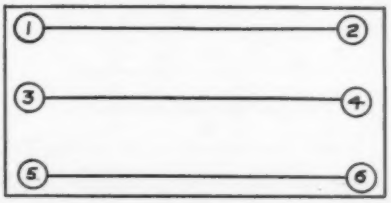


FIG. 2

circuits. The only requirements of this board are:

(1) Signaling the operator.
(2) Signaling the subscriber.
(3) Setting up the talking circuit.

A schematic of a local battery or magneto circuit is shown in *Fig. 4*.

To signal the operator, the subscriber turns the handle of the hand generator four or five times. The current sent over the line passes through the windings of a type of relay known as a

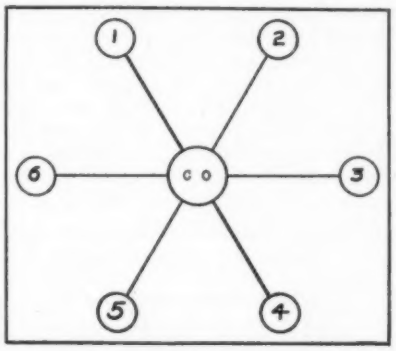


FIG. 3

"drop" located at the central office switchboard. The ringing circuit, as well as the talking circuit, is completed through a ground return. When the current energizes a drop, the armature pulls up, releasing a latch and allowing the shutter to fall forward. The operated shutter indicates the calling line. In falling forward, the shutter rests against a contact which closes a buzzer or alarm circuit wired to a source of electric current at the switchboard. The sound of the buzzer is loud enough to attract the attention of the operator even though she may be away from the board. The details of a typical drop are shown in *Fig. 5*.

The cordless switchboard consists of several groups of switches. Each switch group is arranged in a vertical order on the board. All of the switch groups

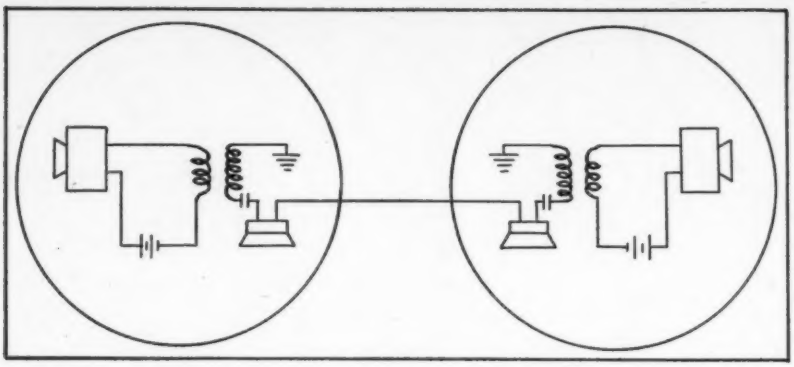


FIG. 4

have common tie circuits or talking paths running horizontally across the board. It is possible, through use of any of these talking paths, to complete a circuit between any two stations connected with the board. A connection is made at the board by operating identical switches of each connecting line to the same tie circuit. When the operator answers the call mentioned above, she will move a key to connect her talking circuit to a vacant tie circuit, then move the same key of the subscriber's line group onto the same tie circuit. While receiving the calling party's order, she will restore the shutter of the drop which will disconnect the buzzer. The called party is signaled by closing the ringing key of that particular line group onto the generator tie circuit of the board. When the called party answers, the two subscribers are connected on the same tie circuit. Upon completion of

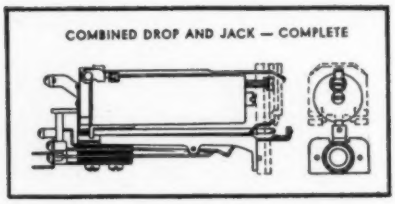


FIG. 5

the call, the calling party rings off by again turning the hand generator handle. The drop operates once more and the operator returns all keys to a normal position and again restores the drop.

Five local battery grounded stations connected to a cordless switchboard are shown in *Fig. 6*. The operator is represented as Station 6. The horizontal common tie circuits of the board are lettered A, B and C. Line D is the generator or ringing circuit. The generator may be either a power operated type, or a hand operated unit.

Fig. 7 illustrates how three separate connections can be made at the same time. Lines 1 and 4 are connected by moving the top key of their respective switch groups onto Circuit A. Stations 2 and 5 are connected over the B circuit. The operator is connected with Station 3 over the C circuit.

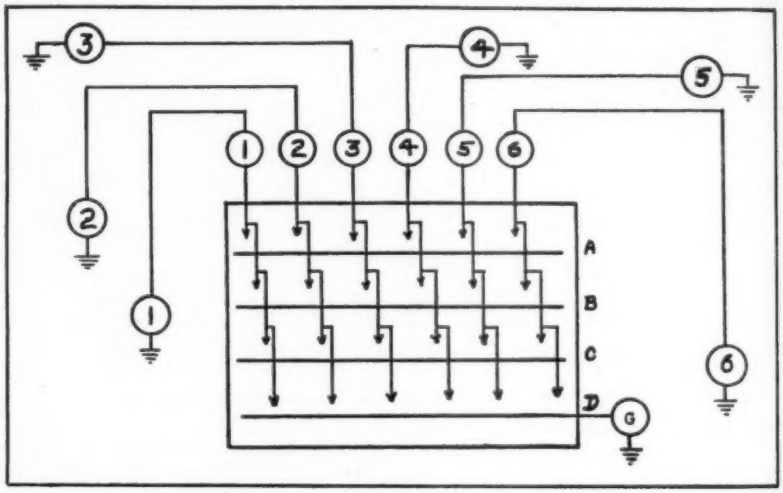


FIG. 6

From this primary stage it is but a short step to the metallic common battery cordless board. The additional requirements are:

(1) Two line wires are used instead of a single wire with a ground return on each station.

(2) Battery is supplied from the switchboard.

(3) The drops are direct current type.

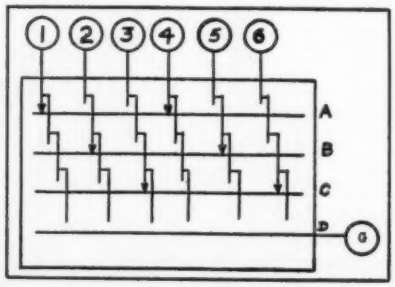


FIG. 7

An improvement on the cordless switchboard with its limited number of station switches and talking circuits is the cord type board. With this switchboard, the connecting circuits are embodied in several pairs of cords. The two wires of the talking circuit and an extra wire for supervisory purposes terminate on the plug. A plug is approximately 3 ins. long and is ⅜ in. or smaller in diameter. Roughly, one-half of the length is taken up by a fibre shield forming a gripping surface used to handle the plug. One of the wires of the talking circuit is terminated at the very tip of the plug. The other wire of the talking circuit is terminated on a small ring which is separated from the tip by a dead collar.

From these connections, the wires of the talking circuit are designated as "tip" and "ring." The third wire, or the supervisory circuit, is terminated on the longer sleeve of the plug. The sleeve is long enough to give the plug rigid support when it is inserted in a jack on the switchboard. Sometimes the supervisory circuit is called the "sleeve" circuit. Obviously, insulation must be provided to separate these various plug parts.

The station line circuit is soldered

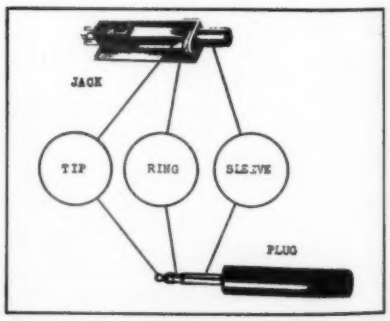


FIG. 8

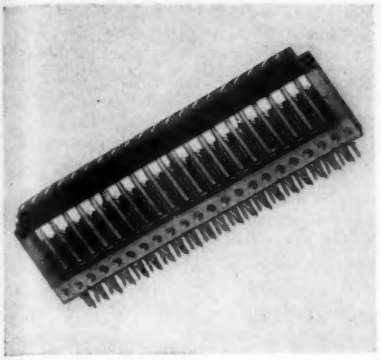


FIG. 9

to a jack which is mounted securely on the face of the switchboard. The jack has a hollow sleeve to fit the plug. The station line wires are terminated on heavy spring clips which are fastened to the jack assembly so as to permit the tip of the plug to make contact with the tip spring of the jack. Likewise, this is true of the ring of the plug and the ring spring of the jack. *Fig. 8* illustrates a plug and jack.

The plugs are fastened securely to cords which are grouped together in pairs. Two stations are connected by inserting the plug of the cord of a pair in the jack of the calling station and the plug of the other cord of the pair in the jack of the called station. Once the cords are inserted, the talking connection is made and is available for use until the cords are taken down by the operator.

Associated with each pair of cords and located on the shelf of the switchboard are two keys, each of which usually has three positions—normal, forward and back. The keys permit the operator to connect her talking circuit into the cord circuit and converse with either station, and also to ring either station. Located on the key shelf of the board are two small opals or caps covering supervisory lamps, one for each cord. These lamps inform the operator whether or not the station is connected in the circuit.

There are several sets of cords provided on cord type switchboards. The greater number of talking paths results in more flexibility than in the case of the cordless type switchboard. This, plus the fact that more stations can be connected to a cord type switchboard, indicates why this type is used in central offices and larger installations of private branch exchange boards.

It is possible to install magneto operated drops as well as common battery line lamps on the same switchboard. This arrangement provides the necessary facilities for switching rural and city lines from the same switchboard.

The old axiom, "necessity is the mother of invention," certainly is true with respect to the modern switchboard. The ever increasing number of subscriber lines terminating at the board, plus the fact that all of these lines must be within the reach of an operator of average size remaining in a sitting position, makes it imperative that a large number of jacks be placed in a small space. The answer is found in the 20-jack strip. Here, 20 individual jacks are placed on a single mounting strip. The reduced manufacturing costs gained from this idea have been passed along to the operating companies. The 20-jack strip is illustrated in *Fig. 9*.

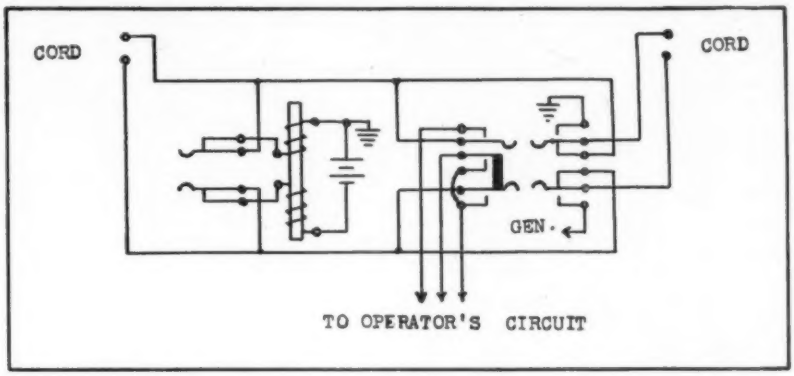


FIG. 12

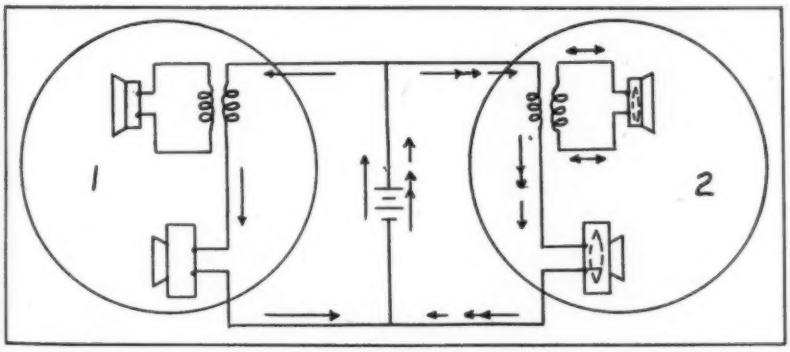


FIG. 10

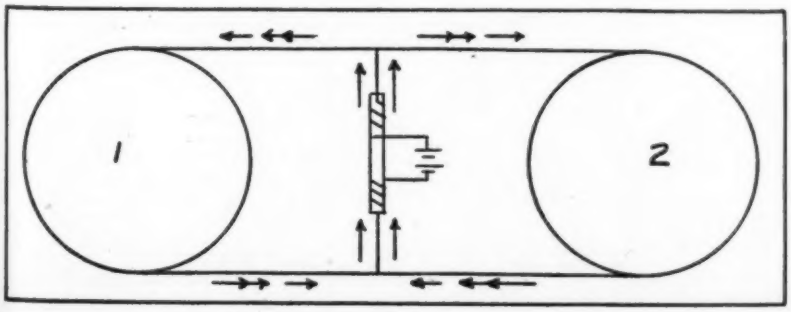


FIG. 11

Throughout the entire switchboard, similar improvements are apparent. The modern switchboard is practically a self-contained unit. All that is needed is a source of battery and ringing current (generator) and the board is ready to serve a group of subscriber lines. The wiring follows a definite color code to simplify manufacturing, installation and maintenance. All of the relays and coils usually are placed on a hinged rack or "gate" located at the back of the switchboard. The equipment for each cord circuit is placed on the rack according to a predetermined plan.

Most of the switchboard maintenance work involves cleaning and adjusting relay contacts or rebutting worn plugs. On the modern switchboard, all of the relay contact adjustments are accessible from the back of the board. To keep out dust and dirt, all of the relays are fitted with covers. The relay iden-

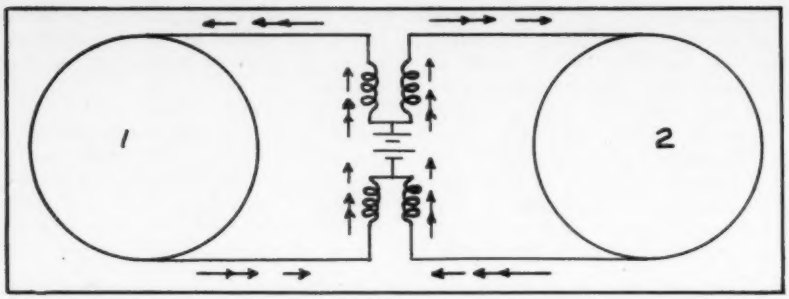


FIG. 13

tification symbol is stenciled on the cover. The approved practice is to remove only the cover of the relay or relays being worked on at a particular time. Dust or dirt will not harm a covered relay.

The relay rack is held closed by one or more thumb screws. When the thumb screws are loosened, the rack can be swung outward to permit access to the cord connections, station wire terminating block, jack wiring, fuses and other apparatus. As the rack is swung outward, the relay and coil connecting wires are seen "cabled" together along the hinged edge of the rack.

With the growth in the number of telephones in use, it becomes apparent that placing batteries at each telephone is not desirable in all cases. Exchanges serving large numbers of telephones generally are arranged to use a common battery. The single battery located at the central office serves the entire exchange area. A storage battery of sufficient capacity is built up by combining storage cells in series or series-parallel connection. Voltage regulators with under and overcharge alarms help to maintain these batteries properly. During heavy, peak load periods, the input charge to the battery must be increased to compensate for the heavy drain. As the load tapers off, the charge gradually is reduced until only a sustaining charge level is reached. Keeping the battery within strict charge limitations greatly increases its life and efficiency.

Special battery supply must be used in the talking circuits of the common battery exchange. The battery is not placed in series with one side of the line, as in the simple circuit, because every circuit in the exchange would be connected together and, therefore, crossed at the battery. If the battery were connected directly between the two sides of the line circuit, as illustrated in *Fig. 10*, each transmitter would be energized. However, when the transmitter of Station 2 is operated by the sound waves, as indicated, the flow of currrent through Station 1 would not be affected. Both stations are sidetone or booster circuits. Therefore, the receiver of Station 2 would operate. The resistance through the battery is much lower than the resistance through Station 1. Practically all of the fluctuating currents created by the transmitter of Station 2 would stay in its own circuit. Station 1 would get none. With this circuit, currents set up by the transmitter of Station 2 do not operate the receiver of Station 1. Obviously, this would be an inoperable system.

Fig. 11 shows only the line and battery supply portions of a circuit. The station details are assumed to be the same as in *Fig. 12*. In this circuit *(Fig. 12)* the battery is supplied through two windings of a retard coil. When either transmitter varies the current on the line, the rapidly changing current finds a path of less impedance through the other station's primary circuit than through the windings of the retard coil and battery. The resistance of the retard coil windings may be 35, 75 or 200 ohms. These resistance values do not reduce the current supplied to the transmitters to a great extent. The action of the retard coil, opposing any change in current flow through it, forces the currents set up by the transmitter of one station through the other station circuit. This would operate the other station receiver. The retard coil maintains a constant supply of direct current to the transmitters, and, at the same time, forces the fluctuating direct current to flow through both instrument circuits. The retard coil is a filter —passing direct current and opposing alternating or fluctuating current.

The retard coil battery supply circuit is used quite extensively in small switchboard installations where all of the stations are relatively the same distance away from the board. The private branch exchange (PBX) is a typical example of this condition. If one instrument located very near the board is connected to another station located a considerable distance away, the current flow through the near station will be increased greatly at the

(Please turn to page 32)

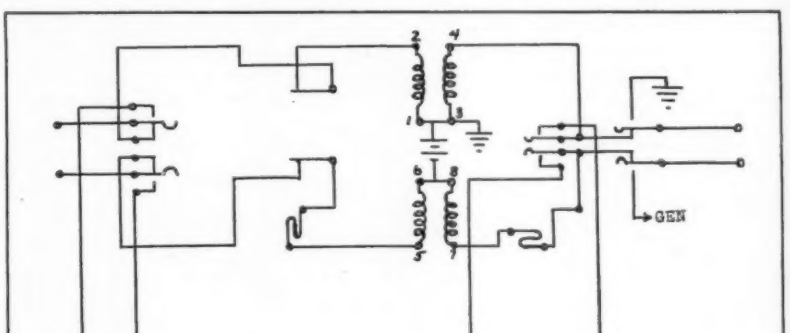


FIG. 14

FIG. 15

Fairly early progress on pending wage legislation expected. . . . Enactment of modified Pepper-Kilgore bill looks like a good bet, says Mr. Welch. . . . FCC permission to equip intercity buses with two-way radio-telephones asked. . . . Cleveland's pioneer radio-telephone cabs have done rapid and efficient job.

NOW THAT President Truman has gone on record as generally favoring an increase in the minimum wage standard for employes, we can expect fairly early progress on such legislation already pending in Congress. The President didn't say in his message just how much of an increase he thought there should be. Here's just what he said:

The goal of 40 cents per hour . . . actually was made fully effective more than a year ago by the voluntary action of the industry committees. I believed that the goal of a 40-cent minimum was inadequate when established. It now has become obsolete. Increases in the cost of living since 1938 and changes in our national wage structure require an immediate and substantial upward revision of this minimum. . . .

I, therefore, recommend that the Congress amend the Fair Labor Standards Act by substantially increasing the minimum wage specified therein to a level which will eliminate substandards of living, and assure the maintenance of the health, efficiency, and general well-being of workers. . . .

The scope of the Fair Labor Standards Act also should be clarified and extended . . . There now exists a twilight zone in which some workers are covered, and others, doing similar work, are not. Extension of coverage would benefit both workers and employers, by removing competitive inequities. . . .

I urge that the Congress act promptly . . .

Following receipt of this message, the Senate Committee on Labor & Education set September 25 for the beginning of hearings on S. 1349. This bill, introduced by Senators Pepper (Fla.), Kilgore (W. Va.) and a half-dozen other left-wing Democratic senators, would raise the minimum to 65 cents an hour the first year, 70 cents in the second year, and 75 cents in the third year. Differentials above these amounts for skilled occupations also would be provided.

This looks like the bill which will be given the greatest push in Congress, although there were 10 bills on the general subject as these lines were written. The Pepper-Kilgore bill would not repeal the exemption now provided in the Fair Labor Standards Act for operators at telephone exchanges of less than 500 stations. Neither, apparently, would the other pending bills on the subject, with the exception of one (H.R. 3719) by Representative Patterson (D., Calif.) which, specifically, would remove the small telephone exchange exemption.

But one wonders just what President Truman had in mind in his reference to a "twilight zone" (in the present law) in which "some workers are covered and others, doing similar work, are not." He probably is referring to agricultural workers, but the situation will bear careful watching. A removal of the exemption and the imposition of such a high minimum (65 to 75 cents an hour) would just about cripple a number of small exchanges.

For that matter, the enactment of the Pepper-Kilgore bill, or anything like it—even with the 500-station telephone exchange exemption retained—would hit many Independent telephone companies pretty hard. Those not covered by the exemption would be hit directly. Small companies still covered would be hit indirectly, by the establishment of a national standard of wages in the rest of the telephone industry, generally. The hiring and retaining of operators at substandard wages by small companies (even though perfectly legal under the exemption) would be most difficult under such generally prevailing conditions of employment. It already is difficult enough.

Note that the United States Independent Telephone Association Employment Relations Committee has formed a special wage-hour subcommittee to keep track of this situation. J. C. Crowley, Jr., veteran secretary-treasurer of the Minnesota Telephone Association, is chairman of the subcommittee. Its other members are: J. Perry Walters, vice president of the Central Iowa Telephone Co., Cedar Rapids; D. M. Davis, manager of the Hamilton County Farmers' Telephone Association of Aurora, Neb., and E. M. Blair, manager of the Blair (Neb.) Telephone Co.

Summing up: The outlook for the enactment of the Pepper-Kilgore bill, in a modified form, looks pretty much like a good bet in Washington just now. It is politically popular. Next year is an election year. The labor union lobbies are in control of the situation. The opposition is confused, disorganized, and not even particularly articulate. Congress well may reduce the initial step of 65 cents an hour and the other steps as well. In fact, this writer will throw in a speculative forecast that the final act is likely to settle on 55 cents an hour, initially at least—with succeeding steps, if any, spread out further than one year apart. But, all details aside, it looks like some kind of a law along this line will get through, if not this year, early next year. Finally, small telephone exchanges had better look sharp to their 500-station exemption. It may not survive in the general attempt of labor forces to eliminate all exemptions.

* * *

Incidentally, the 500-station exemption received another kick from the War Labor Board's National Telephone Commission, in deciding the Up-State Telephone Corp. of New York case. The case involved an Independent company operating in Johnstown, N. Y. Four of its 36 exchanges are within the 500-station exemption. The majority of the commission decided last August 1 to ignore the Fair Labor Standards Act exemption in awarding wage increases ranging from five to 14 cents an hour.

It was not until September 8 that industry members of the commission, Burton W. Saunders and G. K. McCorkle, dissented to this part of the commission's order. They referred to the history of the amendment to the Wage-Hour Act, to the underlying reasons for it, and to the saving clause relating to it in the War Labor Disputes Act which created the National War Labor Board. They stated that the commission had "exceeded its authority," that its action was "unlawful," and that the effect of the order was "to nullify absolutely the exemption" in the Wage-Hour Act.

"Pardon me, counselor, if I use your telephone!" (Courtesy *Public Utilities Fortnightly*)

There was no discussion of this in the commission's majority decision. However, the majority may have felt bound by the precedent set by the War Labor Board in the Illinois Commercial case last November. (TELEPHONY, December 2, 1944, page 27.)

The Saunders-McCorkle dissenting opinion said in part:

It is a matter of which this commission has the right to take judicial notice that conditions surrounding the carrying on of any business in a small town well may differ from those surrounding the same business in a large city. In a small community, for example, that can support a telephone exchange of only 200 or 300 or 400 customers, it is expected that living costs will be considerably less than those in metropolitan centers. This must be apparent when it is considered that in a community of such a size, people ordinarily walk to work; that vegetables and other food stuffs frequently are grown in the back yard or are available from local producers without being loaded down with costs incident to passing through intermediate hands; and that entertainments such as the movies cost less. In such a community, rents, too, are lower.

Likewise, it is appropriate to refer to the fact that the revenue per customer at the small telephone exchange is less than at an exchange in a metropolitan area. At such an exchange, the company simply does not have the revenue with which to pay wages that would be entirely proper in a larger community.

These circumstances must have been the ones Congress had in mind when the House committee, which reported the exemption written into the Fair Labor Standards Act, said: "Small telephone companies, on the whole, are unable financially to comply with the wage provisions of the act.

* * *

Intercity Bus Radio, Inc., Washington, D. C., a division of the National Association of Motor Bus Operators, announced that it had asked permission of the Federal Communications Commission to equip 100 intercity buses with two-way radio-telephone communication and to operate a central control transmitter there.

The experiment is being undertaken by the Greyhound Corp. in cooperation with several other lines running into Chicago. Unless delays are encountered in obtaining licenses, the system will be in operation within 90 days.

Tentative plans, which are expected to lead to the development of a nation-wide system of two-way radio communication on highway buses, provide for the operation of a 250-watt central transmitter in the Chicago Loop. Negotiations are under way for this installation atop the Board of Trade Building.

The buses will be equipped with 50-watt transmitters, combined with receivers. Greyhound plans to install the radio sets on four of its lines—Pennsylvania, Central, Northland and Illinois—running into Chicago. Similar

equipment is expected to be placed on the coaches of several other operating companies.

In addition, there will be three relay receiving stations located in outlying sections of Chicago. These stations will pick up messages from buses on the highways and automatically relay them by land wire to the main control points of the various operating companies in Chicago.

While the 250-watt central transmitter will be able to reach buses as far as 75 miles away, the lesser power of the bus transmitter and the static interference in the loop may not always permit clear reception, except through the remotely operated relay stations. Consideration is being given to the possibility of installing antennas for these relay stations atop the large gas storage tanks that fringe the city.

The central and mobile transmitters will be frequency modulated and will operate on two frequencies of between 30 and 44 megacycles. Not only will the central office be able to talk to and receive messages from buses on the highways, but drivers also will be able to communicate with one another while en route.

"The use of radio control of bus traffic will improve the efficiency and safety of passenger handling," Arthur M. Hill, president of the Bus Operators association, said, "Advance information on incoming passenger distribution will insure prompt connections to other points and also will make it possible to provide additional sections in case of overloads. Departing buses can be held when the delay time is known and, thus, avoid inconvenience of missed connections for passengers.

"So far as safety is concerned, we will be able to route buses around highway obstacles where storms have caused washouts or hazardous road conditions. Prompt help and transportation could be dispatched in case of accidents."

Development of the project is under the direction of Frank W. Walker, who recently joined the Greyhound organization as communications engineer.

* * *

From Cleveland, Ohio, comes news that two-way radio-telephone communication has more than paid its fare for a 10 months' taxi ride there.

A survey made by the Cab Research Bureau indicates that within two or three years, almost all the 50,000 cabs in organized operation in the United States and a large number of the 25,000 to 28,000 privately owned cabs may be taking their calls for trips by radio-telephone.

Since last October, Cleveland has been the testing grounds for the first two-way radio cabs put in service. The two pioneer taxis, picking their calls out of the ether, have done their transportation jobs more rapidly and efficiently than the cabs which get their instructions at taxi-stand telephones.

Because they can be summoned almost immediately, these cabs of the future will have a head start on the stork and they also will, their enthusiasts say, be of great assistance to police and firemen by spotting and reporting burglaries, free-for-alls and fires.

* * *

A new ceremonial telegraph key, mounted on a hand-carved base of black catalinite, was presented on September 12 to President Truman by A. N. Williams, president of the Western Union Telegraph Co. This will be the fourth key to be used by presidents officiating at ceremonies outside of Washington. Prior to 1909, presidents of the United States used two special telegraph keys, and in 1909 a gold key was given to President Taft for use in opening the Alaska-Yukon-Pacific Exposition at Seattle, Wash. The same key also was used by Presidents Wilson, Harding, Coolidge, Hoover and Franklin D. Roosevelt on many occasions, including the opening of the Panama Canal.

Upon the death of Edward W. Smithers, chief operator at the White House, his widow became sole owner of the gold key and a new one was presented to President Roosevelt by Western Union. It now is among the late President's souvenirs at Hyde Park, N. Y.

Best Story of the Week — What's Yours?

Jack J. Mayer, special communications engineer for the Southwestern Bell Telephone Co., St. Louis, Mo., tells the following story on himself:

Recently, he called one of the largest railroads in the country, asking for Mr. X, superintendent of telegraphs. He was told by the operator that the party's line was busy, but to hold on. Later he again got the "still busy" signal from the railroad operator.

In chagrin, he sighed, "Oh, Lord." And, as busy as the operator was, she replied, "Why don't you talk to someone you know?"

Another Step Toward Socialism

Leading electric utility men have expressed strong condemnation of a bill introduced in the Senate to give the Rural Electrification Administration authority to lend upwards of $75,000,000 for the extension of telephone lines in farm areas. More than 6,000 independently owned telephone companies have provided the United States with the greatest telephone service in the world, and will continue to do so.

"Having demonstrated our ability to make progress when equipment has been short," said one telephone spokesman, "we find no evidence that such a bill is necessary. The bill presents real possibilities for uneconomical and disadvantageous duplication of telephone facilities. If its purpose is to make telephone service available in rural areas where such service does not now exist, telephone companies have similar plans."

The Rural Electrification Administration, from a small beginning as is always the case with public agencies, has grown to be a powerful federal spending device and is one of the most potent factors in socializing the electric light and power industry in the United States. Its entrance into the telephone business, through REA channels, would lead to the same political desire to control the telephone industry as now exists to control the electric light and power industry.

If we accept these progressive steps toward socialization of American industry, it will be but a few years until this country has a more powerfully centralized government than existed in Germany before its downfall. The time to stop this process is now.—**Industrial News Review.**

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

WE ARE in receipt of a letter from Charles Bacon of Colombia, South America, in which it is stated that his experience indicates that the "lead borer" does not cause trouble on cable suspended by the spinner method. Our informant states in part:

"Between December, 1939, and September, 1944, I was attached to the local operating telephone company in Trinidad as cable superintendent and, during that time, had cause to fully appreciate the continuous damage done to aerial cables by this lead borer. In fact, this cause of troubles must have run into hundreds of cases during my five years of service in that country. I also experienced somewhat the same trouble in Venezuela, Jamaica and Barbados during previous years.

"From my experience gained in the above mentioned countries, I always have found that the bug bores the hole, which is about the size of a pin head, as near to the cable ring as possible. From this, it would appear that the ring provides some advantage for his handiwork, possibly as a leverage, or as a platform from which he works. After 18 months, it is claimed that cable suspended by the spinner method has not been bothered by the lead borer."

* * *

The underground cable between Boston and Washington, D. C., was placed in commercial operation on February 26, 1914.

* * *

The degree to which a ground approaches a perfect ground depends upon its resistance. Ground resistance is the resistance of an electrical connection to the earth. The lower this resistance, the better the ground. Much serious and expensive trouble often is caused in the telephone industry when this trouble is encountered, for the ground is not suspected and the average telephone company does not have a ready or convenient means of testing.

* * *

A vibrating type tester now is available, complete with batteries, and weighing only 19 pounds. A wide range of resistance values is covered in multiples of 10. The set is most convenient to use, requiring only a press of the button and balancing the galvanometer. The resistance values are read directly at the potentiometer pointer. The set discriminates against stray DC and AC ground currents and potentials. Two No. 6 dry cell batteries supply the current and last for several months without replacement.

* * *

While recently discussing present day cable trouble with C. F. Robinson, telephone engineer of the Fourth Service Command, Atlanta, Ga., he remarked that when cable splicers were permitted to carry a blow torch, fewer splices went bad. He explained this by the fact that the heat of the torch, when played on the splice, brought the tin to the surface and effected a better seal.

We agree with this contention and hope the day is not far off when splicers again will be permitted and encouraged to carry a blow torch.

* * *

We have a letter from R. F. Miller of Riverside, Calif., in which he states that he first heard linemen called "Joe Maggee" in 1926 while working on toll line construction in Utah, Nevada and California. He explains also that these men were sent out on the job after only nine days' climbing experience.

Telephone relays are designed to operate and release on definite current values. Specified current values usually are small and the springs which hold the armatures in a non-operated position must be adjusted accurately. The proper function of a telephone equipment circuit depends on the correct operation of relays. In some circuits, operation limits are such as to permit considerable margin of adjustment while in others this margin is extremely small. Specific operating and release current values are indicated for relays in individual circuits and these adjustments should be observed carefully if trouble-free operation of equipment is to be assured.

* * *

It appears that some of the new plastics, such as "Pliofilm," will be used extensively in the telephone industry after reconversion. This new product would seem ideal for protecting telephone instrument equipment from moisture and dust until such time as required for installation.

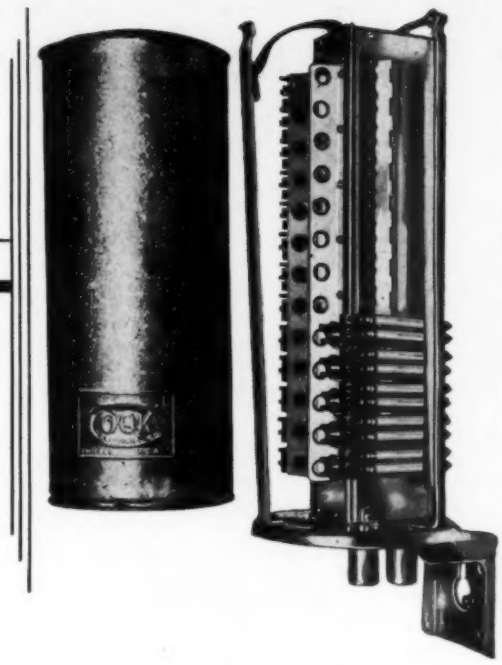
* * *

It would seem that a built-in flasher could be used to advantage on cable splicing trailers and other vehicles which must be left in streets at night. Dry cells are inexpensive and give good life on a properly designed flasher. This arrangement certainly would prove more desirable than kerosene lanterns.

* * *

It is rumored that a vacuum tube with a continuous life of 20 years now is under development. If a tube with such long life can be made available, it could be used to advantage in repeaters for submarine telephone cables.

UA-20



Aerial to Underground
CABLE TERMINAL

by COOK

The UA-20 closely resembles the design of the famous Cook S-20 Pole Cable Terminal. The UA-20 is equipped with two entering nozzles and the cable chamber is equipped with terminating studs for each cable. Protection is provided by the Dual Gap H-20 Protector Unit which connects each aerial cable pair with its adjacent underground pair.

The UA-20 offers many advantages. By simply removing the fuses the overhead and the underground cables are quickly disconnected, permitting testing in either direction. Special test clips with fuse clip adapters and cords are furnished. Service is re-established by reinserting the fuses into the heavy spring clips, which insures constant electrical contact and no resistance loss, an important feature in toll cable transmission.

COOK ELECTRIC Company

2700 SOUTHPORT AVENUE • CHICAGO 14, ILLINOIS

The Operator's Corner

By MAYME WORKMAN
TELEPHONY's Traffic Editor

An open letter to all switchboard operators throughout the nation.

Dear Girls:

The war is over! The victory is won! Seated at your switchboards on such a memorable day, a day that will go down in history, it was your privilege to spread the glad tidings. Forgotten were the days of toil, the heartaches and disappointments, as you strived to answer the calls that flooded your switchboards.

Long distance calling records were broken following Japanese surrender announcement on August 14. Long distance calls continued for two days at an exceptionally high rate. The traffic volume far exceeded that of VE-day.

Operators who were not on duty when the surrender announcement came, hurried to their central offices to report for victory duty. Many stayed all night.

Local service throughout the country increased beyond previous experience. In some exchanges calls could not be completed because the volume of traffic was beyond the capacity of the equipment to handle it. Customers, as well as operators, accepted the situation cheerfully and understandingly.

In no way minimizing the fine work of telephone employes in all departments, the chief operators and supervisors, and telephone employes in the armed forces, this is a special tribute to the operators at the switchboard, the faithful girls who carried the heavy wartime traffic loads, day in and day out.

Speaking from observation, the writer would like to review some of the major problems of switchboard operators during the war. What she saw in the exchanges she visited and her contacts with the operators in these offices were repeated over and over again in telephone exchanges throughout the nation.

Shortage of facilities: Operators strove to carry a six-position load on a two-position switchboard. Signals came in and there were no cords with which to answer them. Tickets piled up and there was no time to work on the calls, because operators were kept busy answering recording signals. This frequently occurred in the beginning, before make shift equipment was pressed into service.

An office appears before the writer's vision. Operators were working like trojans, but the signals kept coming in. The toll switching operator was giving out "no trunk" reports. No positions nor operators were available for relief. The chief operator was "sweating it out" with her girls. This condition existed for weeks until management could make some temporary make shift arrangements to ease the load until additional facilities could be secured. The operators never complained. The only evidence of the tension was slightly raised voices.

Loads were heavy for experienced operators and new girls, too, who were being inducted into the operating forces during an abnormal time. Many of the new operators never saw a normal load until some time after the surrender of Japan. What a pleasant surprise was in store for them! The operators with many years of service took up the slack in the load the new girls could not carry. A large number of experienced operators had worked at the switchboard during World War I. One of these girls remarked, "Gosh, I don't know if I can work through another war or not." She made a brave try, but ill health prohibited her from seeing the job through.

There were days when the nervous tension almost was unbearable. There was the day when an inexperienced toll operator was ready to give up because the stack of tickets before her seemed as high as Pike's Peak. She beat her hands on the switchboard and said, "I just can't work on all of these calls." A soothing word from the supervisor and distribution of the tickets among the other operators, followed by a short relief period, allayed her fears and she went back to her position with a smile and a determined tilt to her chin, indicating she would master the situation.

Restlessness was a disturbing factor. A frequent remark was, "I wonder if I should quit and go to work in a war plant where I can contribute to the war effort?" Many operators did not realize the importance of their position in winning the war. A word of explanation usually sufficed. Temptation to take a more lucrative position ever was present. Some operators succumbed to this temptation while thousands remained at their posts of duty.

Switchboard operators were not immune from worry over loved ones in the armed services. It was not uncommon to see tears slowly rolling down an operator's cheek. Alert supervisors and chief operators soon were at her side to give needed relief, a word of comfort, or whatever else the situation required.

Seeing an operator in the rest room with a sad or discouraged expression on her countenance usually meant "no letter today" in answer to a call home from the rest room telephone.

Training suffered in many exchanges during the war. Supervisors frequently were called upon or voluntarily took over a position at the switchboard when loads were heavy. Operators failed to receive that all important follow-up training.

Equipment difficulties due to inability to repair switchboard equipment promptly beset the operators, too. Ragged cords annoyed them, as did defective keys and other switchboard facilities in need of repair.

The six-day-week, coming after many operators had enjoyed a 40-hour week, added another burden. Heavy traffic loads over a six-day period tired operators and many operators looked forward to a shorter work week. "I'm so tired," was a common expression and "I don't find time to do the things I should do," was another.

Obtaining necessary appointments with doctors and dentists was a problem, too, to say nothing of the difficulty in securing an appointment at a beauty parlor. The latter may seem a trivial item, but it is a most important one to "us girls." To cancel such an appointment was a sacrifice, but many operators did not hesitate to cancel an appointment when their services were needed at the switchboard.

The writer deems it a privilege to have worked with you during the trying period of the war, to have taken a position and worked beside you on occasions when it was possible to do so. To have listened to your problems, giving advice and counsel when solicited. Just as GI Joe was in the front lines in battle, you, too, were out in front

(Please turn to page 30)

WTH *into your "specs"*

VGER AUTOMATIC

omatic equipment you buy
morrow. Your selection of
e and for all.

merely slip new switches
add complete shelves,
the end of each shelf.
nes with shelves and
ion may be, existing
us, Strowger Auto-
as they arise—at
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as *proved* its
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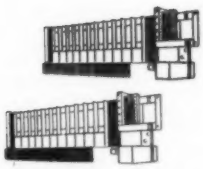
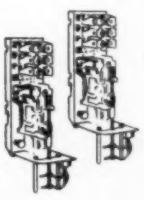
A.
ON

STANDARD FRAMES are rigid, welded-and-bolted steel structures of standardized design, upon which the switches and shelves are easily mounted.



STANDARD SHELVES provide mounting facilities and switch jacks, with all wiring completed to a terminal block at the end of each shelf.



STANDARD SWITCHES each comprise a complete switch mechanism with associated relays—wired, and with wiring terminated on a "jack" on the base.

Oklahoma Association Aids Rate Increase Applicants

The Oklahoma Telephone Association, through H. W. Hubenthal, secretary, has assisted two Independent telephone companies in preparing and filing applications with the Oklahoma Corporation Commission, requesting rate increases.

Ralph W. Winsted, owner and manager of the Winsted Telephone Co., Tyrone, Okla., which serves 106 subscriber stations in Tyrone and 105 in adjacent territory, has asked for annual increased rates as follows: Business, one-party telephones, increased from $30 to $36; business, two-party rural, from $18 to $24; business extension, $12 (no change); residence, one-party, from $18 to $21; rural multi-party, company owned facilities, from $15 to $18; rural-switched, from $6.00 to $7.80 per year.

The Winsted company alleges that at present rates it is operating at a loss of $1,484 per year, without counting interest earnings.

Jack Ratts, manager of the Hammon (Okla.) Telephone Co., is asking for the following proposed annual rate increases: One-party, business, from $30 to $36; two-party, business, $27 to $33; business extension, from $12 to $15; residence, one-party, from $18 to $21; residence, two-party, $15 to $18; residence, four-party, $12 to $15, and for rural multi-party service on company owned facilities, from $15 to $21. Desk or handset, $3.00 per year in addition to regular rates; rural, multi-party service on company owned poles and wire lines with subscriber owned telephones, from $9.00 to $18 per year. For rural service, a minimum of $54 per year per line is asked.

The Hammon company serves 196 subscribers—107 on company owned plant and facilities, and 89 on pole lines owned by the company with telephones owned by the subscribers. When 6 per cent earning on property used and useful is considered, the company claims to be operating at a loss of 15.6 per cent.

Greatly increased operating costs, including higher taxes and wages since present rates were fixed, are given by both companies as principal reasons for asking higher rates. Both, also, state that a falling off of 40 per cent in toll revenues is expected and that propects for higher wage costs are in the offing.

Dates for hearings on these cases have not yet been set.

V V

Pennsylvania Independent To Abandon Operations

The Pennsylvania Public Utility Commission, in an order dated August 6 and effective 90 days after that date, approved the application of the Karthaus Rural Telephone Co., Inc., Frenchville, to abandon service now furnished in Karthaus, Covington, Girard and Goshen townships, Clearfield County. In making application, the ill health of the owner-manager, J. Sayers, and his inability to obtain the services of an experienced telephone man to maintain the plant were cited.

The Karthaus company furnishes service to approximately 400 subscribers from its magneto central office. Future service of the area is undetermined.

V V

Service Discontinuation Rights Challenged by Subscriber

The move of the Wisconsin Telephone Co., Milwaukee, to discontinue telephone service to establishments suspected of disseminating horse racing results was challenged in circuit court September 13 by Louis Simon, operator of the Badger News Service.

The telephone company served notice on Mr. Simon on September 10 that it would disconnect his telephones September 15 because it was suspected they were being used for "an illegal purpose."

On Operator Simon's petition, Circuit Judge Daniel W. Sullivan on September 13 signed an order requiring the telephone company to show cause, September 15, as to why it should not be barred from disconnecting the telephone service.

In his plea for the order, Mr. Simon said his concern uses telegraph and telephone service to obtain news of public and sporting events of various types from all over the nation, to be disseminated by him to a list of subscribers.

V V

Rate Cut Ordered for Two Firms; Increase for Third

Two telephone companies serving the Grant County, Wis., area have been ordered to reduce their rates, while the Fennimore (Wis.) Telephone Co., which serves approximately 800 customers there, has been granted a rate increase, the Public Service Commission of Wisconsin announced recently.

The Grant County Telephone Co., Montfort, and the Annaton & Preston Telephone Co., Montfort, had filed applications for increased rates, but the commission ordered the two firms to cut their charges so that their earnings are 6 per cent on their investments, rather than the present approximate 18 per cent.

The Fennimore company will raise its rates from 20 to 50 cents a month, per customer, depending on the type of service, but will abolish its 25-cent a month charge for handset telephones and 15-cent charge for desk sets. It will make a flat $1.50 charge for changes made at the request of customers.

Approves Sale of Kenyon, Minn., Independent

Authority to sell and transfer certain telephone property of the Kenyon (Minn.) Telephone Exchange to Elnathan Gates, individual purchaser, was granted September 10 by the Minnesota Railroad & Warehouse Commission on joint application of both parties.

The commission found that Mr. Gates, upon consummation of the purchase of the Kenyon company, which is a co-partnership, proposes to assume all its assets and liabilities. Such transfer and acquisition of property, it stated, would not conflict with the public interest, and would result in adequate and reasonable service being furnished in the territory of the company, which would continue operating under the same name.

No consideration was given as to the value or the price paid therefor.

V V

Names Edward R. Thornton to New Hampshire Commission

Edward R. Thornton, Manchester lawyer and insurance executive, has been appointed by Gov. Charles M. Dale and confirmed September 10 by the New Hampshire Executive Council to the New Hampshire Public Service Commission. He succeeds the minority member, former Mayor William H. Barry of Nashua, who had been a holdover on the commission since June 1.

Born in Boston, Mass., Mr. Thornton attended Boston University School of Administration and in 1932 was graduated from Suffolk University School of Law there. In addition to his law practice, he is claims attorney and supervisor for the Employers' group of insurance companies, with offices in Manchester.

V V

Sells Pennsylvania Independent

Joint application was made recently to the Pennsylvania Public Utility Commission by the United Telephone Co., Harrisburg, purchaser, and the McClure's Gap Rural Telephone Co., Carlisle, seller, for the sale of the latter company, which operates in North Middleton and Lower Frankfort townships, Cumberland County. The consideration was $445.

V V

Files Dissolution Decree

A decree of dissolution recently was filed with the Washington Department of Public Service for the Willapa Valley Telephone Co., Willapa. The company serves 256 farm lines which are switched by the Pacific Telephone & Telegraph Co. at its Raymond exchange.

Emergency Rate Increases Sustained by Circuit Court

Judge Henry J. Ingram of the Tazewell County Circuit Court of Illinois, on June 28, 1945, sustained the order of the Illinois Commerce Commission, dated December 21, 1943, ordering an emergency increase in telephone rates for the Illinois Central Telephone Co., Clinton. The rates as ordered by the commission were put into effect February 1, 1944, and increased wages were made effective at the same time. (TELEPHONY, January 15, 1944, page 30.)

The Office of Price Administration and the city of Washington, Ill., appealed the order, but did not ask for an injunction to restrain the company from putting the rates into effect.

The Illinois Central Telephone Co., whose stations in service have increased since the new rates were made effective, was represented before the commission and the court by Attorneys Arthur E. Nelson of St. Paul, Minn., and John F. Gibbons of Jerseyville, Ill.

The revised rates which were sustained by order of the court are as follows (the number of stations at each of the exchanges listed can be found in TELEPHONY's *Directory*):

Hopedale, Kenney, Middletown, Niantic, Sparland, Waynesville and Weldon

Class of Service	*Net Monthly Rate*
One-party, business	$3.50
Two-party, business	2.75*
Rural multi-party, business	3.00
One-party, residence	2.50
Four-party, residence	2.25
Rural multi-party, residence	2.25
Switching service	1.00**

*Applying to Hopedale, Niantic and Weldon only

**Applying to Kenney and Niantic only

Mansfield

One-party, business	$3.50
Two-party, business	3.00
Rural multi-party, business	3.00
One-party, residence	2.50
Four-party, residence	2.25
Rural multi-party, residence	2.25

Illiopolis and Macon

One-party, business	$3.50
Two-party, business	3.25
Rural multi-party, business	3.00
One-party, residence	2.75
Two-party, residence	2.50*
Four-party, residence	2.25**
Rural multi-party, residence	2.25
Switching service	1.00

*Applying to Macon only

**Applies to Illiopolis only

Bunker Hill

One-party, business	$3.50
Rural multi-party, business	3.00
One-party, residence	2.50
Four-party, residence	2.25
Rural multi-party, residence	2.25
Switching service	1.00

London Mills

One-party, business	$3.75
Two-party, business	3.25
Rural multi-party, business	2.50
One-party, residence	2.50
Four-party, residence	2.00
Rural multi-party, residence	2.25
Switching service	1.00

Greenview and Williamsville

One-party, business	$3.50
Two-party, business	3.25
Rural multi-party, business	3.00
One-party, residence	2.75
Four-party, residence	2.25
Rural multi-party, residence	2.25
Switching service	1.00*

*Applying to Greenview only

Farmer City

One-party, business	$3.50
Two-party, business	3.00
Rural multi-party, business	3.00
One-party, residence	2.75
Four-party, residence	2.25
Rural multi-party, residence	2.25

Maroa

One-party, business	$3.50
Two-party, business	3.00
Rural multi-party, business	3.00
One-party, residence	2.75
Four-party, residence	2.25
Rural multi-party, residence	2.25

Auburn

One-party, business	$3.75
Two-party, business	3.50
Rural multi-party, business	3.00
One-party, residence	2.75
Two-party, residence	2.50
Four-party, residence	2.25
Rural multi-party, residence	2.25

Henry

One-party, business	$3.75
Rural multi-party, business	3.50
One-party, residence	2.75
Four-party, residence	2.25
Rural multi-party, residence	2.25

Princeville

One-party, business	$3.75
Two-party, business	3.25
Rural multi-party, business	3.00
One-party, residence	2.75
Two-party, residence	2.50
Rural multi-party, residence	2.25

Girard and Virden

One-party, business	$4.00
Two-party, business	3.50
Rural multi-party, business	3.00
One-party, residence	2.75
Two-party, residence	2.50
Four-party, residence	2.25
Rural multi-party, residence	2.25

Gillespie and Benld

One-party, business	$4.25
Two-party, business	3.75
Rural multi-party, business	3.00
One-party, residence	3.00
Two-party, residence	2.75
Four-party, residence	2.50
Rural multi-party, residence	2.25

Abingdon

One-party, business	$4.25
Two-party, business	3.75
Rural multi-party, business	3.00
One-party, residence	3.00
Four-party, residence	2.50
Rural multi-party, residence	2.25
Switching service	1.00

Chillicothe

One-party, business	$4.25
Two-party, business	3.75
Rural multi-party, business	3.00
One-party, residence	3.25

Two-party, residence	3.00
Four-party, residence	2.50
Rural multi-party, residence..	2.25

Sullivan

One-party, business	$4.25
Rural multi-party, business...	3.00
One-party, residence	3.25
Four-party, residence	2.50
Rural multi-party, residence..	2.25

Washington

One-party, business	$4.25
Rural multi-party, business...	3.00
One-party, residence	2.75
Four-party, residence	2.25
Rural multi-party, residence..	2.25
Switching service	1.00

Carlinville

One-party, business	$5.00
Two-party, business	4.50
Rural multi-party, business...	3.50
One-party, residence	3.50
Two-party, residence	3.25
Four-party, residence	2.50
Rural multi-party, residence..	2.50

Clinton

One-party, business	$5.00
Two-party, business	4.50
Rural multi-party, business...	3.50
One-party, residence	3.50
Two-party, residence	3.25
Four-party, residence	2.50
Rural multi-party, residence..	2.50

Applying to All Exchanges

PBX trunks (where quoted)
1½ times main line rate or next lower multiple of 25 cents.

Joint user service (where quoted)
1½ of main line rate or next lower multiple of 25 cents.

Optional common battery service in magneto exchanges (where quoted), business or residence, additional charge, 50 cents per month.

V V

Rejects Plan to Limit Practice Before Commission to Attorneys

The Virginia State Corporation Commission, whose functions include the regulation of telephone companies and other utilities, September 14 rejected a proposal that practice before it be restricted to active members of the Virginia State Bar. (TELEPHONY, June 30, page 25.)

The three members of the commission—H. Lester Hooker, Harvey B. Apperson and L. McCarthy Downs—each filed separate opinions against the proposal, which was filed by the state bar.

The commissioners agreed that "it has not been shown that it would be in the public interest to adopt the said proposal of the Virginia State Bar, by its Third District Committee."

Members of the commission split two to one on the question of whether that agency has authority to define the practice of law before it. Judges Hooker and Downs held the commission has such power, while Judge Apperson ruled it has not. They agreed unanimously, however, that to forbid "qualified" laymen, such as tax experts and rate experts, to conduct cases before the commission would impair and interfere with the efficient handling of duties imposed upon the agency.

V V

Oklahoma Company Seeks Higher Rates

C. F. Mathis of the Oakwood (Okla.) Telephone Exchange recently filed an application with the Oklahoma Corporation Commission requesting the following increased rates:

Type of Service	*Present Rates*	*Proposed Rates*
Business telephones	$2.00	$2.50
Residence telephones, company owned ..	1.50	1.75
Residence telephones, subscriber owned.	1.25	1.50
Rural telephones, company owned ..	1.00	1.50
Rural telephones, subscriber owned.	.75	1.25

The company alleges present monthly revenue is $127.50, against operating expense, without allowance for depreciation, of $155 per month. Hearing has been set for October 31.

V V

Hear Minnesota Independent Service Complaints

Investigating service complaints made by subscribers to the Hills (Minn.) Telephone Exchange, the Minnesota Railroad & Warehouse Commission ordered a public hearing held October 2, at which time evidence as to the condition of plant and equipment and character of service will be presented.

The commission ordered that service of the order be made on L. J. Gordon, owner of the company, which serves the village of Hills and the surrounding rural community, and that such notice also be published in the *Hills Crescent* on September 20.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

September 4: Granted Southwestern Bell Telephone Co. and American Telephone & Telegraph Co. authority to supplement existing facilities between Kansas City, Mo., and Hutchinson and Wichita, Kan., at estimated cost of $436,900.

September 4: Granted New England Telephone & Telegraph Co. authority to construct and operate toll cables between Bangor and Dover, Me., estimated cost, $357,976; between Concord and Dover, N. H., estimated cost, $282,203; between Lewiston, Farmington and Rumford, Me., estimated cost $570,974.

Illinois Commerce Commission

September 18: Hearing on application of Illinois Valley Telephone Co., Streator; Illinois Telephone Co., Jacksonville; Automatic Home Telephone Co., Pontiac, and Illinois Central Telephone Co., Clinton, for orders excepting certain proposed contracts from provisions of Public Utility Act of 1921, covering purchase from and services by Telephone Repair & Supply Co., Chicago.

September 18: Hearing on application for rate increases for Edgewood (Ill.) Telephone Exchange and Farina (Ill.) Mutual Telephone Co.

September 19: Hearing on application of Millstadt (Ill.) Telephone Co. for authority to borrow $3,000 and secure repayment by mortgage upon certain real estate.

Minnesota Railroad & Warehouse Commission

October 9: Hearing on commission's investigation of complaint by Mrs. Clarence Goertz concerning territory invasion of Bremen Party Line Telephone Co., Millville, by Hammond (Minn.) Telephone Co.

October 16: Hearing on application of Audubon (Minn.) Telephone Co. for authority to increase rates.

Wisconsin Public Service Commission

September 19: Rehearing on application of Lisbon Telephone Corp., Sussex, for increased rates and for authority to install dial switchboard and other improvements there.

V V

Southwestern Bell Sues For $1,375 Damages

The Southwestern Bell Telephone Co., St. Louis, Mo., recently filed suit for $1,375 damages against the estate of the late Edgar B. Duncan, former member of the board of public works who was killed in a motor car accident near north Kansas City last December.

The litigation is the outgrowth of the wreck. The telephone company claims that Mr. Duncan's car crashed into a company truck loaded with telephone poles.

V V

May Increase Wages

Under revised National War Labor Board General Order No. 30, employers now may, without obtaining permission, increase wage rates up to 55 cents an hour even if price relief may be required. Previously, wages could be increased to that amount without approval only when price relief was not indicated.

V V

Named European Representative

RICHARD A. LUMPKIN, president of the Illinois Consolidated Telephone Co., Mattoon, recently was appointed European representative of the Communications Committee of the Technical Industrial Intelligence Committee, which was organized under the Joint Army-Navy Chiefs of Staff.

"What was the charge on that call operator?"

Because the switchboard is equipped with CALCULAGRAPHS, the Central Office has an immediate and accurate record of each toll call, making the handling of this important load fast and accurate.

The CALCULAGRAPH provides the essential time data for charging long distance calls accurately and quickly—time of day, and elapsed time of each call, however great the volume of business handled.

Photo, Courtesy Kellogg Switchboard & Supply Co., Chicago

The speed, ease and dependability of the CALCULAGRAPH in service has made it standard equipment for the majority of switchboard manufacturers and has brought it into use all over the world.

CALCULAGRAPH COMPANY

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SIGNAL CORPS MEN SHOW VERSATILITY IN EUROPE

MANY of the Signal Corps technicians, who were responsible for establishing and maintaining in Europe the world's greatest military communications system, had no practical telephone experience prior to their entry into the Army.

With their sole knowledge of communications, gained through short, intensive courses at Signal Corps schools, as their stock in trade, these men have spider-webbed dependable radio and telephone circuits throughout France, Belgium, parts of Holland, Germany and the United Kingdom.

Foreign equipment was utilized in all countries where the Germans or underground forces had not completed its destruction. In other cases it was necessary to import American equipment. A typical station is the installation at Namur, Belgium.

When Signal Corps troops moved into this city, they found a bombproof, gasproof building that the Germans previously had used for a telephone installation. Unfortunately, all equipment had been destroyed, but Belgian underground cable still existed in reasonably good condition.

A survey immediately was made of the situation, the equipment necessary to start operations was determined, and equipment captured from the Germans at Rheims, France, was brought in. It included four wire repeaters, four wire terminating sets and ringers, oscillators, power bays to supply the necessary voltages to the sets, and a distributing frame.

This was all French and German equipment, but it did not faze the Signal Corps units who were given the job of putting it into operation. Personnel from the 298th signal installation company worked rapidly and efficiently to install the job. They were aided by a team from the 3112th signal service battalion which also took over the job of operating and maintaining the station as soon as it was installed.

However, much of the equipment was in bad condition due to the way the Germans had left it and the rough trip it had made from France, and the under-manned unit from the 3112th found it difficult to keep the entire installation operating. A repeater team from the 3112th was called in to do the repair work.

Standard parts were difficult to obtain, so substitutes had to be improvised or the parts salvaged from other damaged units. The repair job finally blossomed out into a full-fledged repair depot, and telephone equipment of any type was repaired for all stations. Gradually a small reserve of important units was built up: Repeaters, terminating sets, oscillators and power bays. A spare frame was built. Thus any station that needed equipment quickly to expand or to replace old units could find it.

Everything now was operating smoothly, but it was necesary to look ahead.

At this time the Belgian station was mainly a terminal. Most of the lines came from the direction of Paris and went through a four-wire repeater and a four-wire, two-wire terminating set to a headquarters switchboard. The time was envisaged when this headquarters would move forward to Germany and the circuits would have to be extended to their new positions.

It was decided that these circuits would be extended on open wire using two-crossarm leads. The CF-I-A and CF-7 arrived after a long trip over the old redball express route, and personnel from the 3111th temporarily left their repair work to install this equipment.

On setting it up they found a barrelful of trouble. The bays had travelled a long way over roads that were not always smooth; broken wires, nicked insulation, and relays out of adjustment were common. However, the troubles were all cleared and the equipment was ready for operation.

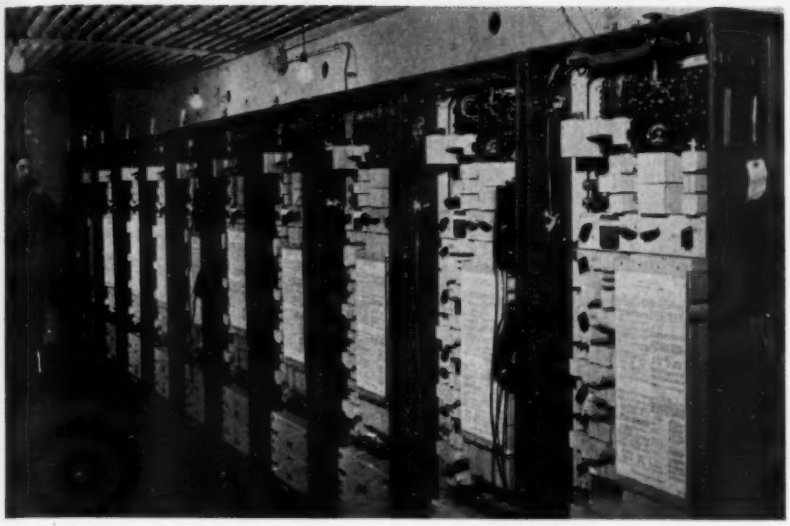
The equipment was to be set up so that each four-wire repeater would feed into one channel of a CF-I-A bay, be modulated, pass into the CF-7 hybrid, go out on an open wire pair to the distant terminal where it would pass through another CF-7, be demodulated in a CF-I-A, and go to the ringer and switchboard.

The difficulty of having a four-wire repeater feed into a two-wire channel on the CF-I-A was solved by opening the hybrid coils in each channel and bringing the resulting four wires which originally went to the receive and transmit side of the hybrid coil, to the frame. At the frame they could be jumped quickly to the receive and transmit pairs coming out of the four-wire repeaters.

In addition, to increase flexibility, the terminals of the hybrid coil also were brought to the frame and jumpered to the high frequency side of the CF-I-A and the open wire pairs. Upon test the system operated satisfactorily despite the fact that 1,129 ft. of entrance cable was used.

The entire job was installed to combine permanence and flexibility. All equipment was mounted so that it easily could be removed for repair and maintenance. All connections were brought to the frame; 1,200 ft. of 10-

T/4 FRANK H. H. GREENE, New York City, is shown checking rehabilitated French made repeaters at Namur, Belgium.



These telephone carriers transmit four telegraph and three voice channels on each pair of wires. At left, T/3 ARVIN T. APPLE of La Valle, Wis., is shown testing a wire at Namur, Belgium.

pair cable were used for this purpose. However, in all high frequency circuits, the receiver or low level pair and the transmit or high level pair, were kept in separate cables. This helped considerably in minimizing crosstalk.

The CF-I-A bays were mounted on 2 x 6 planks so that all cable could come off the cable racks and go under the bays where it would be invisible. The cable for each bay broke out behind the bays, was butted, fanned out and laced alongside of existing wiring. The result was a neat, workmanlike job and the modifications in wiring were unnoticeable to a casual eye.

This installation is merely one example of the type of work being done by the Signal Corps. Similar installations exist all over the continent. Existing foreign equipment is used wherever possible. Necessary packaged American equipment is taken in. American equipment is worked together with foreign equipment.

Co-Operator, Not Competitor, Should Be Role of Government

The government should act as a "co-operator rather than a competitor in postwar farm telephone service, clearing the way for free enterprise to forge ahead without undue handicaps," according to an article by L. R. Neel, entitled "Farm Experience and Philosophy," in the September issue of *Southern Agriculturist*.

Mr. Neel first reviews bill S.1115, introduced into the Senate by Senator Lister Hill of Alabama, proposing to amend the Rural Electrification Act to provide or improve service to persons in rural areas by providing loans at a very low rate of interest on long term basis to individuals, corporations, state agencies, municipalities and co-operatives or mutual telephone companies, as well as the REA, to finance improvements in existing companies or build new ones.

The article, in part, continues as follows:

Here are some of the facts about the American telephone system. There are more telephones in the United States than in all the rest of the world; there are more farm telephones in the United States than in all the rest of the world; the over-all telephone service and the farm service in this country are the best in the world. Is this not a great record that should cause us to stop and think before throwing any monkey wrenches into the system?

Farm telephone expansion was phenomenal in the first two decades of this century. Then, for many reasons—an important one being the economic situation—the number of telephones on farms declined steadily until 1935. Then the downward movement stopped and expansion started again. This has continued right up to the present moment, in spite of the handicaps of wartime construction. Already there are 500,000 more farm telephones than in 1935.

Today the telephone companies have in their files 2,000,000 applications for telephones, a due proportion of which are rural. The American Bell System, alone, plans to put $100,000,000 into the expansion of rural telephones in the postwar period, and plans to add 1,000,000 farm subscribers within three to five years after the war. The thousands of lesser companies are making plans for similar expansion programs.

Money for loan never was so abundant nor interest rates so low. Any farm community that wants telephone service and is willing to exercise some of the initiative essential to life in a democracy can have this service at the cost of less pounds of tobacco, cotton, pork or butterfat than ever before. Furthermore, it is a vastly better service than that which existed when the number of farm telephones reached its peak in 1920.

The part that the government should play in this postwar farm telephone expansion is not that of a competitor, but a co-operator, clearing the way for free enterprise to forge ahead without any undue handicaps. Assistance well could be provided by helping to eliminate interference brought about by the erection of some of the REA lines. Of course, the state utility commissions sit as umpires to see that the public gets fair treatment.

V V

Marion (Ind.) "Chronicle" Praises Indiana Bell Company

An editorial in the August 24 issue of the Marion (Ind.) *Chronicle* strongly lauded the Indiana Bell Telephone Co. for continuing to render its efficient standard of service during the war years.

The article reads as follows:

Like other public utilities, the Indiana Bell Telephone Co. has continued to provide its usual standard of service for the past four years with little recognition or thanks from the general public or the federal government agencies. There have been no Army-Navy "E" flags, no speeches, no fanfare for the hundreds of employes who stayed on the job, often overtime, so that service for the community would be prompt and efficient.

Keeping the 8,100 telephones in the area in working order against the odds of shortages of new equipment and replacement parts has been no small task. The fact that the service has not declined in quality is surprising in consideration of the vast amount of material which had to be diverted to the armed forces for maintaining vital communication lines.

Added to the decreased supply of labor and material has been an increased demand for telephone service. It has not been possible to install new telephones each time they were requested. Instead, officials placed the service where it would do the most to serve the war effort and the greatest needs of the city. But when service has been refused, employes have been courteous and have explained fully why it was impossible to connect new service at the time.

V V

Iowa Independent's New Building Nears Completion

C. C. Pearce, manager of the Farmers Telephone Co., Riceville, Iowa, revealed recently that construction of a new telephone building at the company's New Haven exchange was nearing completion.

He stated that the possibility of delivery of new dial equipped handsets and office equipment late this fall was very likely, and that the new building would contain the very latest type of switching apparatus.

ONLY MINUTES TO GO—AND GI's CALL GOES THROUGH

By S/SGT. JOHN L. MURPHY
Allied Force Headquarters, Italy

YOU have five days leave in Rome and as you wander about the city in search of amusement, a small sign in a large doorway catches your eye. It says: "Transatlantic Telephone Service."

A telephone call home to your wife, whom you haven't seen in 30 months, would be pretty wonderful, but you recall a story in *Stars & Stripes* that said only 25 out of 70 calls each day get through. You probably wouldn't have time.

But the urge seizes you and the first passerby, a person who works in the building, directs you to the second floor, which bears the Fascist insignia on the wall. At the top of the stairs, you join the line of soldiers and officers waiting to book a call, and it's all of three hours before you finally see the booking office door. At last you get through the door, but not without a suspicious glance from the MP standing guard. You are about to pull out your pass when he says, "Move along, Joe."

Inside, an Italian woman employed by Italcable Co., which handles the Italian end of the telephone connection, smiles, so you take a seat opposite her and fill out the questionnaire she hands you. She marks it with a serial number and passes it down the line where a signorina gives you a ticket, booking the call for your last day in Rome.

You pass the next few days in pleasant anticipation and each day haul out your little white ticket just to make sure it's still around. Finally, the time comes. Your call is booked for 5:00 p.m., Rome time—11:00 a.m., New York time. You're there at 3:30, because you figure it doesn't hurt to be a little early. Again you go through the large door of the telephone building, and suddenly you remember: Only 25 out of 70 calls get through. Your call *has* to be made today because tomorrow you'll be on your way back to the rest center and soon en route to the Pacific.

The booking line still is long and across the hall is the "ready room" where 15 worried GI's and officers are sweating it out. An OD clad soldier, walking from the back of the room towards the cashier's desk, asks how long it will take. "I've only got another hour on pass," he says.

As if in reply, a neatly dressed man steps through the door and announces, "Number 4516 is ready." The soldier follows him. Five minutes later another such scene takes place.

The first soldier with an 88th Division patch now comes out and there are tears running down his cheeks. His mother fainted the moment she heard his voice, he says. You begin to wonder if your wife will cry. You only have three minutes.

At last the neatly dressed man announces a number, yours. Your stomach does a quick flip. When you've untangled your legs from the chair, he tells you, "We are sorry but New York reports that your party doesn't answer."

"I know they're home," you shout.

"We'll try again," says the man.

You settle down a little and another GI, clad in sun-tans, emerges from the telephone room, his face wet with perspiration. He grabs a waiting friend by the arm and says, "Let's get drunk. I just spent the happiest three minutes of my life."

Through the open window you can see the sun dropping behind the buildings on Rome's western outskirts. How much longer must they take?

You are now consuming cigarettes in quick succession. The man who announces the numbers passes the doorway and in near desperation you follow him up and down the hall. Finally, he sees fit to recognize you and you ask worriedly about your number.

"We'll try again," he says.

Seeing him talk to you, five other persons stop him. Each gets the same answer.

The heat suddenly catches up with you. You are hungry, but afraid to leave the room.

Again a fortunate GI, this time a corporal, comes out of the telephone room. He excitedly tells his friend, "Yeah, I recognized the voices right away. My brother said 'reverse the charges and talk some more' and didn't I wish I could."

The lamp outside now dimly lights the street. A few cars go by and you hear a gang of GI's singing "Californeye-ay." You remember that curfew at the rest center is midnight.

As you turn to stride in the other direction, you see a lieutenant colonel hiking along beside, obviously worried. He says, "The radio transmitter they use to broadcast these calls to the States has broken down."

You try the neatly dressed man again. "We'll call New York," he replies.

The word that the transmitter has broken down has spread and now there are 10 others pacing the floor with you and the colonel. At last comes the word that the transatlantic telephone again is operating.

There is only half an hour left before the last bus leaves for the rest center. Hope of talking to your wife diminishes by the minute. Then the door of the telephone room opens and the operator, an Italian-Russian girl, calls your number.

You turn and say, automatically, "Did you say number 5420?" She smiles and nods her head.

Inside the booth, a large, wooden-panelled one with double windows in the door, you seat yourself and wait.

"Hello, traffic," says the operator. "Ready with 5420. Go ahead."

"Hello, darling," you shout, "Can you hear me?"

"Yes, honey. Can you hear me?"

"Say something, darling."

"When are you coming home?"

"Not for a long time," you reply and your voice catches a little. "Darling, can you hear me?"

"Yes I can hear all right," she says and then pauses. "I had so many things to ask you but I can't remember them. Anyway, I wrote them all in a letter. . . . Can you hear me?"

"Say good-bye," interrupts the operator, and suddenly you feel homesick and glad, all at the same time.

V V

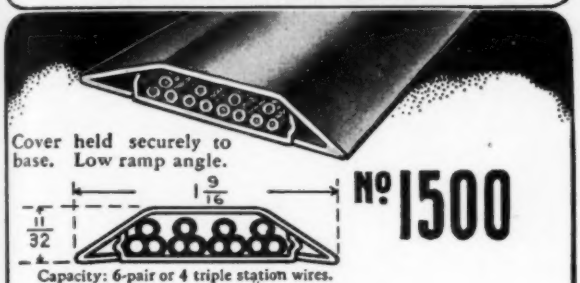
Rochester, N. Y., Suburbs To Get Dial Telephones

Dial telephone systems are to be extended in the Rochester, N. Y., area to six suburban stations, it was announced recently. The dial telephones will be installed in Caledonia, Scottsville, Pavilion, Victor, Castile and Wyoming.

Construction work for the new program will begin this month, according to the Rochester Telephone Corp.

FOR OVER FLOOR TELEPHONE WIRING SYSTEMS

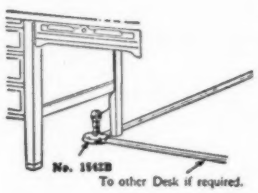
PANCAKE WIREMOLD



Cover held securely to base. Low ramp angle.

Capacity: 6-pair or 4 triple station wires.

No. 1500



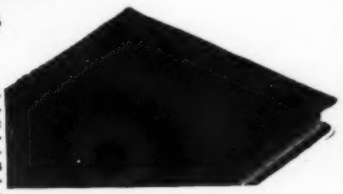
Designed to meet telephone company requirements for extension wiring.

Send for Catalog and Wiring Guide No.16 and Wiremold Engineering Data Sheets on Telephone installations.

THE WIREMOLD COMPANY, HARTFORD 10, CONN.

What the COMMUNICATIONS WORKER NEEDS

to know about electricity



Radio men, telephone engineers, telegraphy technicians — all workers in the communication industry — here is a book written expressly for you. It gives you a clear, practical explanation of the fundamentals of electrical engineering *upon which communication is based.* All the explanations, all the illustrations, all the applications are taken from the communication industry and not from the power industry.

THE ELECTRICAL FUNDAMENTALS OF COMMUNICATION

By A. L. Albert, Professor, Communication Engineering, Oregon State College; Professor, Electrical Engineering, Purdue University (1942-43); 550 pages, 6x9, 359 illustrations, $3.50.

Presents the electrical fundamentals of communication, including the three divisions—telegraphy, telephony, and radio with its allied branches. Starts with electronics, explains what the communication technician wants to know about direct current, conductors, resistors, insulators, and discusses such topics as the magnetic field and inductance and the electric field and capacitance solely from the point of view of the communication industry.

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- Electric networks
- Bridge circuits
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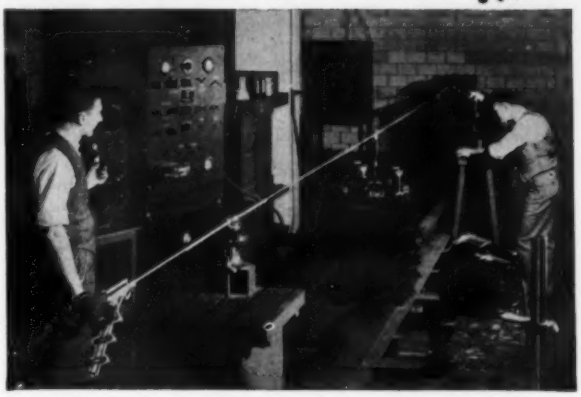

In our unique Vibration Fatigue Laboratory, Amertel and Amerstrand conductors are constantly being tested under all conceivable conditions of tension and vibration. The effects of hardware, tieing methods and construction practices on amplitude, frequency and damping capacity are under unceasing investigation.

THE PERFORMANCE records rolled up by our products on nationwide telephone and telegraph systems are the combined result of continuous laboratory research and observation under actual field conditions.

That is why the combination of Amerstrand Steel Strand, Amertel Telephone Wire (both made of extra tough, hard steel) preformed armor rods, and advanced tieing methods (which prevent abrasion and reduce vibration) means fewer line breaks, greater efficiency and lower "over-all" cost for outside plant operators.

Extra strength makes possible longer spans, less line failure under wind and ice loads, longer life in service for conductors, guys, messengers and ground wires. And it also means savings in man hours and materials that keep construction and maintenance costs down to rock bottom.

Both of these products of the American Steel & Wire Company are produced to a high standard of "Controlled Quality." Every production step, from ore to finished product, is under strict control and experienced supervision. Long life in service is assured by a special process of applying the zinc coating, which furnishes the utmost protection against corrosion.

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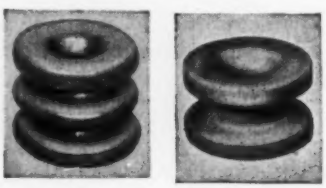

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⅝" and 1"
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$\frac{5}{16}$", ⅝", ⅞" and 1"
STRAIN INSULATORS

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BUCKEYE
TELEPHONE & SUPPLY CO.
COLUMBUS, OHIO

The Operator's Corner

(Concluded from page 18)

giving your all to speed up the calls which helped to bring victory to our nation.

Sometimes we are so near to a situation we fail to realize its importance and the role we are playing. The following verse expresses the results of your labor most eloquently:

Three Minutes

"I have a call for you." Oh, magic words!
Sweeter and dearer than song of birds.
And then a voice so clear and gay!
"Hello, folks! Everything's O.K.!"
Three minutes just fly, but we rejoice,
For haven't we heard our loved one's voice?
The telephone's inventor we heartily bless—
Miles apart? You'd never guess.
Three minutes? Oh, what joy!
We heard the laugh of our soldier boy!
—*Mary L. Sharkey*

Sincerely yours,
Mayme Workman

Questions from Illinois Operators

(1) On a station-to-station collect call, where the called station does not accept the charge and the calling party is not available, or does not answer, is the call subject to a report charge?

(2) How much should you charge for messenger service?

(3) What entry should be made on a ticket when it is canceled at midnight?

(4) On two ticket calls, what disposition should be made of the ticket at midnight?

(5) What is a dial tone?

Answers to these traffic questions are presented on page 36.

V V

Check Personality, Habits In Questionnaire

For a quick check on personality traits and work habits, the following questionnaire has been prepared by Helen Childers, supervisor of traffic results for the Indiana Associated Telephone Corp., Lafayette. How do you rate?

(1) *Alertness.* Do you make it a point to have a clear understanding of matters passing through your hands? Check for errors? Observe for future reference?

(2) *Responsibility.* Do you consistently obey instructions? Assume responsibility in handling duties? Carry through to completion?

(3) *Judgment.* Do you measure importance of matters? Think clearly? Obtain full facts, assume unbiased attitude, take time in making decisions?

(4) *Application.* Do you proofread, check and recheck? Take precautions to avoid repeating mistakes?

(5) *Speed.* Do you act promptly? Efficiently?

(6) *Initiative.* Are you a "self-starter" in getting things done without direction?

(7) *Adaptability.* When interruptions occur, do you accept them quietly and resume normal routine as soon as possible?

(8) *Cooperativeness.* Do you accept criticism gracefully and profit by it? Get along with others agreeably? Offer to do extra work when you can?

(9) *Diplomacy.* Are you tactful and courteous at all times? Is your behavior, dress and speech in good taste?

V V

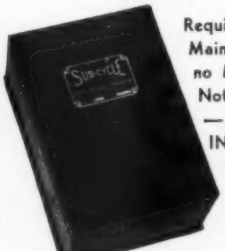
Installs Radio-Telephone

The Baltimore & Ohio Railroad recently announced plans to install radio-telephone equipment in its yard at New Castle, Pa., and expects it to be ready for operation by October 1. The installation will be used to facilitate the operation of the freight car classification yard there.

It's "OK" SUB-CYCLE
The Master Ringing Converter

Used successfully and approved by Telephone Companies — Railroads — Power Companies — Private Industry — Fire Alarm Systems—Telegraph Companies—Pipe Line Systems.

Unique in Design



Requires no Routine Maintenance — Has no Moving Parts — Nothing to Adjust — NO RADIO INTERFERENCE — Economical and Quiet in Operation.

Has "Tone Coil" Too

This built-in "Tone Coil" produces reverting ringing tone where such service is provided.

Write for Information Today

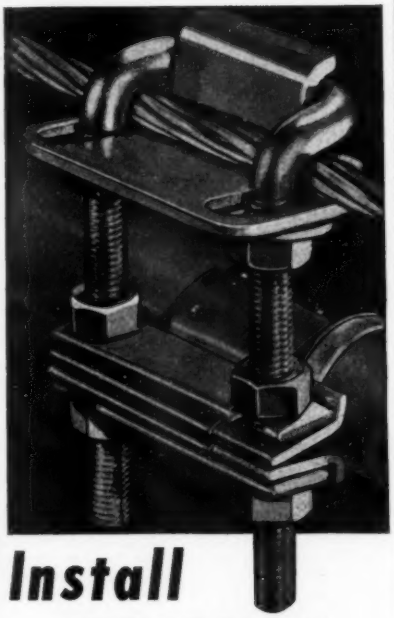
LORAIN PRODUCTS CORPORATION
LORAIN, OHIO

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

DISTRIBUTED THROUGH JOBBERS

TELEPHONE ACCESSORIES

STOP CABLE SLIPPAGE



Install KEARNEY GRADE CLAMPS

Kearney Grade Clamps are adjustable to any spacing of the cables and messenger. The cinch type of fastening makes a firm but non-injurious grip on the cable. Widely spaced legs provide long bearing surface on messenger and cable for greater resistance to slipping. Also available for two cables hung from the same messenger.

FOR COMPLETE INFORMATION AND PRICES SEE YOUR JOBBER OR WRITE

JAMES R. KEARNEY CORPORATION
4236 CLAYTON AVE. ST. LOUIS, (10) MO.

Appoints Special Subcommittee On Wage-Hour Legislation

In order to enable the United States Independent Telephone Association to give close and detailed attention to pending wage and hour legislation, including the making of plans for any appearances that may be necessary before congressional committees, President John P. Boylan, at the request of the USITA Employment Relations Committee, recently appointed a subcommittee to that committee. It is called the "Special Subcommittee on Wage-Hour Legislation."

Members of the subcommittee will function under the main committee, with its cooperation and assistance whenever needed. In making appointments, especial attention was given to finding persons particularly informed respecting the problems of the smaller companies.

The new subcommittee consists of the following members: J. C. Crowley, Jr., secretary, Minnesota Telephone Association, St. Paul, Minn.; D. M. Davis, Hamilton County Farmers Telephone Association, Aurora, Neb.; E. C. Hunt, Blair (Neb.) Telephone Co.; Samuel Tucker, president, Pleasanton (Kan.) Telephone Co., and J. P. Walters, vice president, Central Iowa Telephone Co., Cedar Rapids, Iowa.

Members of the Employment Relations Committee are: Chairman, J. H. Agee, Lincoln, Neb.; F. M. Browne, Kansas City, Kan.; H. W. Holmwood, Santa Monica, Calif.; Kelley McNish, Bristol, Tenn.; L. F. Shepherd, Springfield, Ill.; R. E. Shotts, Columbus, Ohio, and R. E. Williams, Chicago.

V V

Institute Elects Campbell, Izard, Mason, Directors

S. W. Campbell, vice president and comptroller of the Pacific Telephone & Telegraph Co., has been elected a director of the San Francisco control of the Controllers Institute of America, New York City.

B. P. Izard, Georgia auditor of the Southern Bell Telephone & Telegraph Co., similarly was honored by the Atlanta control, and C. S. Mason, auditor and assistant secretary of the Pacific Telephone & Telegraph Co., was elected a director of the institute's Seattle control.

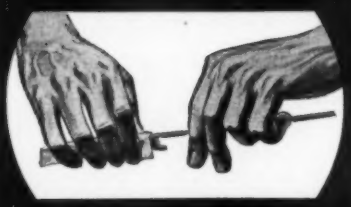
V V

Heads War Fund Committee

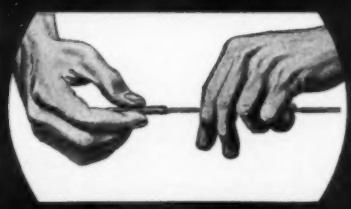
WILLIAM A. KIETZMAN, a New York (N. Y.) Telephone Co. vice president, has been appointed chairman of the Advance Employe Gift Division of the New York National War Fund, which is campaigning for $16,723,222 for war service agencies.

You can make a better splice faster THE Nicopress WAY

1. CLEAN ends of wire



2. INSERT wire in sleeve



3. COMPRESS with Nicopress Tool

THE NATIONAL TELEPHONE SUPPLY COMPANY

Ask YOUR JOBBER

The National Telephone Supply Company
5100 SUPERIOR AVENUE
CLEVELAND 3, OHIO
Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA
Export Distributor
INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

ABC of the Telephone

(Concluded from page 12)

expense of the distant station transmitter. In a direct proportion, the distant station transmitter will have a greatly reduced flow of current. The current divides after it passes through the resistance of the retard coil winding and from that point it seeks the path of least resistance back to its source. Excessive current would flow through the near station, whereas the current flow through the distant station would be insufficient for proper operation.

At cord type PBX boards, the stations are relatively the same distance from the board and retard coil battery supply circuits usually are satisfactory. The essentials of a typical PBX cord circuit are shown in *Fig. 12.*

When it is necessary to supply a relatively constant EMF to either station, whether or not they are equal distances from the switchboard, a repeating coil is used in the battery supply circuit. This condition arises in the central office where it often may be necessary to connect the station nearest the office with the one furthest away.

In *Fig. 13,* the two stations are supplied with current through the windings of a repeating coil. From an examination of the illustration, it will be noted that direct current is supplied to each station through separate windings of the coil. When the transmitter at Station 1 is operated, the fluctuating direct current flows only in its own circuit through the repeating coil. The action of the repeating coil is quite similar to an induction coil. Current changes in one circuit are repeated across the coil windings into the associated circuit with very little energy loss. Unlike an induction coil, there is neither a step-up nor a step-down in the repeating coil. In this type of coil, it is an even one-to-one repeating arrangement. The current that is repeated into one of the circuits is superimposed on the direct current already present in the circuit. From this, the characteristics of the current in the receiving circuit are quite similar to the fluctuating direct current set up in the sending circuit.

It will be noted that the circuit divides into its two separate sections before it passes through the repeating coil windings. This supplies each station with sufficient current for proper operation without regard to their relative distances from the switchboard. Naturally, there will be a difference in the amount of current at each transmitter as governed by the line resistance.

A typical cord circuit equipped with a repeating coil as used in a central office is shown in *Fig. 14.* Again, only the essentials are shown to bring out the battery supply feature.

Still another method of coupling two station circuits is shown in *Fig. 15.* In this circuit, current is furnished each transmitter through a separate retard coil. The condenser placed in each line between the retard coils provides a path for the fluctuating direct current to complete its path through the station circuits. This circuit has an advantage over a single retard coil because it furnishes sufficient current to each transmitter whether or not they are an equal distance from the switchboard. The retard coil, when compared with a repeating coil in a switching circuit, has poorer transmission qualities, especially when used over long circuits.

(To Be Continued)

V V

French Telephone Service Is Marked Contrast to American

The *Sun Dial,* house organ of the Peninsular Telephone Co., Tampa, Fla., contrasts French and American telephone service, quoting a recent American dispatch from France as follows:

"The French telephone system currently is one of the more mysterious phenomena on the face of the globe. It is a common experience to find yourself suddenly conversing with someone who has telephoned you while you were talking to someone else. Apparently finding your conversation dull for eavesdropping purposes, the operator simply cuts in another call. . . . A call via civilian lines from here to Reims, 75 miles distant, takes at least three hours."

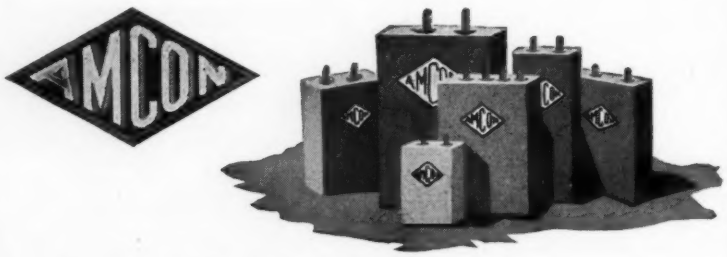
The telephone system in France, as in most European countries, is government operated. Millions of Americans have had their first experiences with this quality of service, which contrasts most unfavorably with our own service.

"Here in this country," says the *Sun Dial,* "the high degree of telephone development has been a result of private enterprise and initiative."

V V

Transfer Managers

WALTER DAY, formerly manager of the Western Light & Telephone Co. at Clarence, Mo., has been transferred to that position at Canton, Mo. FAY TILS of Shelbina replaces him as manager at Clarence.



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AMERICAN TELEPHONE
AND
TELEGRAPH CONDENSERS

SPECIFICATION SHEETS ON REQUEST

AMERICAN CONDENSER CO.
4410 No. Ravenswood Ave., Chicago 40, Ill.

Sets Hearing Date On Wage Bill

The Senate Committee on Education & Labor tentatively has set September 25 for the beginning of hearings on bill S.1349 which proposes to make the minimum for unskilled occupations 65 cents an hour the first year, 70 cents an hour the second year and 75 cents an hour the third year, with higher differentials for skilled occupations.

The hearings are to be held before a subcommittee of Senators Pepper, Thomas, Tunnell, Aiken and LaFollette.

V V

Takes Bids For Independent

Sealed bids for the purchase of the Farmers & Merchants Telephone Co., Flaxton, N. D., are being accepted until October 1. The Independent, which has exchanges at Columbus and Lignite, N. D., is owned by Roy Burau.

V V

Appoint Tuscola Manager

CARL E. SCHAEFFER of Olney, Ill., has been appointed manager of the Tuscola office of the Illinois Commercial Telephone Co. He fills the vacancy left by the resignation of RAYMOND BEBSON recently.

V V

OBITUARIES

ALVA HURST, 74, plant superintendent of the Arlington (Ind.) Telephone Co., died September 4 of a heart attack.

Surviving are his widow, a daughter, four step-daughters, two sisters, three brothers and three grandchildren.

* * *

ARTHUR C. PAUL, 67, Cincinnati, Ohio, associated with the Cincinnati & Suburban Bell Telephone Co. for 35 years prior to his retirement in 1935, died September 9 at his home. He is survived by his widow, a son and a sister.

* * *

S. W. LOWRY, 85, one of the charter members of the Grant City (Mo.) Telephone Co. and for many years secretary of that company, died August 19 at his home following an illness of several years.

He is survived by his widow, two brothers and a sister.

* * *

CHARLES WILLIAM HOLDEN, SR., 61, Hamlet, N. C., chief supervisor of telephones of the Seaboard Air Line Railway, died September 5. He is survived by his widow and five sons.

STROMBERG-CARLSON

Recommends...

for FASTER, EFFICIENT, SAFER DRYING OF CABLE SPLICES

PROTEK-SORB*

desiccant

Mfd. by The Davison Chemical Corporation

PROTEK-SORB desiccant will give you greater all-around efficiency in desiccant drying of cable splices. Because of its small mesh size, it fills every crevice around the wires, drying them completely . . . providing quick return of voice-carrying ability.

It won't attack metals or insulation . . . gives off no fumes or odor. Easily handled . . . packed in convenient-size air-tight containers ready for use on the job.

Ask your regular telephone jobber for Protek-Sorb desiccant.

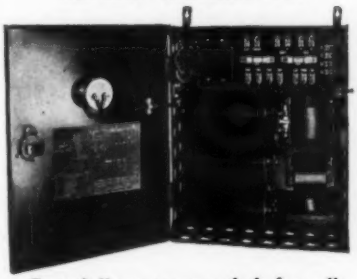
*Reg. U. S. Pat. Off.

ELECTROX

CONSTANT VOLTAGE BATTERY ELIMINATOR

Type RA

Manufactured by Schauer Machine Co.



Especially recommended for all Lamp Signal and Automatic Switchboards.

Completely Automatic
Requires No Manual Adjustments

Delivers smooth, humless, constant output voltage irrespective of current drain, up to the maximum output of the rectifier. Standard rectifier capacities of 1 to 4 amps., from 12 to 48 volts.

- **LOW FIRST COST**
- **LOW OPERATING COST**
- **DEPENDABLE SERVICE**
- **LONG LIFE**

Write for Circular 443

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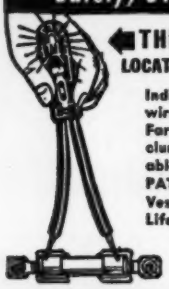
Factory and General Offices: Rochester 3, New York, U.S.A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

Test-O-Lite

TESTS ANY VOLTAGE...
100 to 550 Volts, A.C. or D.C.
—Safely, Swiftly, Surely



THE NEON GLOW
LOCATES TROUBLE INSTANTLY

Indicates hot or grounded wires. Tells AC from DC. Far superior to ordinary clumsy test bulb. Indispensable in shop or home. Has PATENTED safety features. Vest pocket size. Life time guarantee. List $1.50. Purchase thru electrical dealers.

For Quick Soldering

A small quantity applied to the joints to be soldered will, WHEN HEATED, flow and unite the parts the same as wire and bar solder. No flux or soldering iron required. 25c tubes; 1, 5, 10 and 25-lb. cans.

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Victory Loan Aims at $11,000,000,000 Goal

Secretary of the treasury, Fred M. Vinson, has announced the last bond drive, the Victory Loan, to begin October 29 and to close December 8. The aim of the Victory Loan is to secure 11 billion dollars in bonds to help pay the bill for World War II.

The money secured from this final drive, among other things, is to be used for care of the wounded and rehabilitation of veterans, cancellation and termination of war contracts, to help prevent inflation and to aid in bringing servicemen home from overseas.

An official bulletin from the Periodicals Section of the War Finance Division, U. S. Treasury Department, said, in part, "We believe the American people should — and will — lend their money to help pay our debts to the men who fought our war and were hurt doing so."

The bulletin continued:

"In the past four years, the American people have shown excellent judgment, by and large, in their attitude toward bond buying. As individuals, as communities, as a whole, they have, through their bond buying, laid the foundation for a sound and prosperous postwar economy.

"If they can be persuaded to exercise that same good judgment during the critical times immediately ahead, we have nothing to fear."

For the last time, America — buy extra bonds!

V V

Show's Over! Mexicans Now May Point Out Needs

Harry P. Sentman, manager of the Fairmont (Minn.) Telephone Co., for some time had watched the sometimes agonizing bits of pantomine performed by Mexican customers of the local stores in order to make known their wants.

This year, these purchasers, who come north to work in the fields in Martin County, Minn., no longer need do everything from a strip act to an imaginary prayer in order to indicate they wish a Sunday shirt, for Mr. Sentman has prepared a list of Spanish words and phrases with their equivalents in English, for business places to keep within handy reach.

V V

New Telephone Operators

DOROTHEA THOHOFF of Iola, Kan., is the new chief operator at the Moran exchange of the Central Kansas Telephone Co., Inc., and DEANIE BELLINGER of Moran is the relief operator.

THE LINE IS BUSY!

We mean the Production Line at our Plant where every effort is being made to supply the demand for this masterpiece of seating comfort.

MODEL 2451

The operator's choice. One of two models. Adjustable in height. Rolled steel construction. Comfort speeds communication.

CRAMER Posture Airflow

CHAIR COMPANY
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and all other purposes requiring a superior waxed twine.

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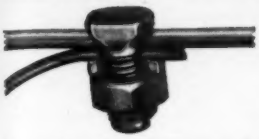
Gloucester Philadelphia (6) Baltimore (3)

Reliable Has Forged Bolt Connectors; Price Sheets Out



Reliable Electric Co., Chicago, recently announced that forged bolt connectors now are available in five sizes—for No. 9, No. 6, No. 4, No. 2 and No. 1 solid wire, which, the company stated, will have the same efficiency as the machined type and a higher copper content.

A comprehensive 32-page price sheet has been issued listing the company's complete line and containing prices and descriptions of communication protective and terminal equipment used by telephone companies; also, power line connectors and construction specialties employed by power companies. Copies may be obtained by writing to the company at 3145 Carroll Ave., Chicago 12, Ill.

V V

GI's Overseas Seek Sales Positions

American GI's expect to sell the world in the postwar era, if an average week's mail received by the Stromberg-Carlson Co., Rochester, N. Y., from its employes in the armed services overseas is any criterion.

Lloyd L. Spencer, vice president and general sales manager of the communications firm, revealed recently that the company's sales division has received almost 100 letters of application from its employes on military leave and other American servicemen, requesting sales positions in the foreign lands where they have been stationed.

Mr. Spencer said that some of the GI correspondents preferred to start their colonizing job after a company orientation and training course. He revealed that a survey of both the company's telephone and radio divisions is under way to determine postwar possibilities of overseas markets.

V V

Emphasizes Safety Program

To meet the challenge of postwar automobile driving conditions, the New York (N. Y.) Telephone Co. is placing added emphasis on its Accident Prevention Program through a campaign which will be sponsored by the drivers of its fleet of over 345 trucks and passenger cars in the Hudson, N. Y., area.

WHITNEY BLAKE

WB

WELL BUILT WIRES SINCE 1899

Change No. 19 and 22 INSIDE TELEPHONE WIRES TO PLASTITE*

Order by WHITNEY BLAKE Catalogue No.

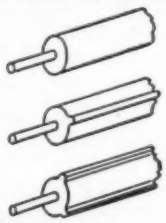
No. 19 Twisted Pair
Brown or Ivory—19PN-2

No. 19 Triple
Brown or Ivory—19PN-3

No. 22 Twisted Pair
Brown or Ivory— 22PN-2

No. 22 Triple
Brown or Ivory— 22PN-3

Raised Ridge in Insulation for Polarity



THE RIDGE shown in the enlarged section is extruded on one leg of a twisted wire where both are the same color. This ridge makes tracing easy in darkness or in light. The third leg of a triple wire has two ridges.

* Reg. U. S. Pat. Office

PLASTITE* Insulated Inside Telephone Wire is —

1. Small Diameter. Makes a neater job on inside wiring.
2. Colors are bright and permanent, easier to see.
3. Strips Cleanly and Easily.
4. Practically Ageless.
5. Trouble Free Installations.
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7. Lower Cost.

A TRIAL ORDER of this bright, smooth extruded PLASTITE* Insulated Wire will convince you that it is the ideal Inside Wire.

Order Now for Prompt Shipments.

Ask GraybaR for Prices and Samples

Distributed by GraybaR Electric Company

The WHITNEY BLAKE Company

New Haven, Connecticut, U. S. A.

Answers to Traffic Questions on Page 30

(1) Yes.

(2) Charge the actual amount spent for such service.

(3) "Ca midnight" should be entered in the upper right hand corner on the face of the ticket.

(4) On two ticket calls, carry forward the OUT ticket if you are the OTC and the IN ticket if you are the TTC under the same conditions as tickets covering single ticket calls.

(5) A dial tone is a steady humming sound, indicating that the equipment is ready to receive the dial pulses.

Cook Electric Aids Atomic Bomb Development

Laboratories of Cook Electric Co., Chicago, were revealed by Walter C. Hasselhorn, president, as another Chicago participant in the production of equipment involved in processing of materials for the atomic bomb which was used against Japan.

Some of the devices developed by Cook engineers and technicians at the request of, and in cooperation with, government-designated engineers and scientists, were devices which had no prototypes in the field of material processing equipment. All such work was conducted in the greatest secrecy at the company's Chicago laboratories in a special section under augmented military guard beyond that already required by the Military Security Forces for protection of other war work areas. Personnel of the company's facilities did not know the nature of the developments nor the ultimate use of the equipment being developed, Mr. Hasselhorn said.

V V

M. L. Joslyn Resigns

At a special meeting on September 10 of the board of directors of the Joslyn Manufacturing & Supply Co., Chicago, Ill., sponsors of the Joslyn Profit Sharing Plan, M. L. JOSLYN tendered his resignation as president of the company. B. S. HANDWORK was elected by the board to succeed Mr. Joslyn to that position. Mr. Joslyn was elected chairman of the board of directors.

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B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Pensacola Creosoting Company, Pensacola, Fla.—Creosoted Southern Pine. Poles of Superior Long Leaf Quality.

Reconstructed Equipment

Kellogg No. 610 S. A. enclosed gong steel signal sets with Anti side tone coil and Condensers and straight line ringer @ $7.50
Stromberg Carlson No. 1158 Enclosed gong steel signal sets with 1000 ohm straight line ringer & Cond. $5.00 with Booster Coil @ 6.00
Auto. Elec. L No. 510A. O. enclosed gong steel signal sets with Booster coil 1400 ohm ringer and Cond. @ 6.50
Western Elec. No. 2C 80 ohm Ball type drops coils @ ..... .40
Western Elec. No. 323 Trans Less backs $1.25 with back @ 1.35
Kellogg No. 22 Trans. without back $1.25 with @ 1.35
Western Elec. No. 22C Shutter type drops and jacks per strip 5 @ 10.50
Western Elec. No. 2C Ball type drops and jacks per strip 5 @ 8.25

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For poles, crossarms, and other timber products. Preservative treatments of timber products. Analyses of wood preservatives.
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